

Bureau of Design and Environment Manual

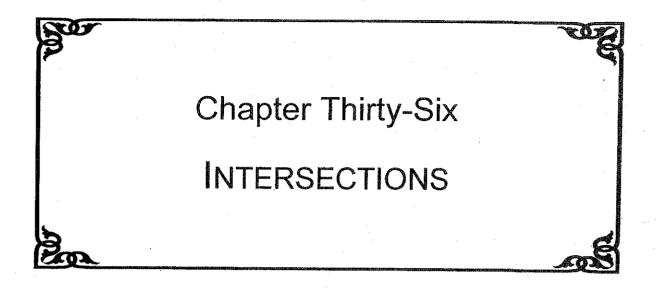




PREFACE

The Bureau of Design and Environment Manual has been prepared to provide uniform practices for the Department and consultant personnel preparing Phase I studies and reports and contract plans for Department projects. The Manual presents most of the information normally required in the development of a typical roadway project. The designer should attempt to meet all criteria and practices presented in the Manual; however, the Manual should not be considered a standard that must be met regardless of impacts. The designer should develop roadway designs that meet the Department's operational and safety requirements while preserving the aesthetic, historic, or cultural resources of an area. Designers must exercise good judgment on individual projects and, frequently, they must be innovative in their approach to roadway design. This may require, for example, additional research into the highway literature.

The Bureau of Design and Environment Manual was developed by the Policy and Procedures Section within the Bureau of Design and Environment with assistance from the engineering consulting firm of Roy Jorgensen Associates, Inc.



BUREAU OF DESIGN AND ENVIRONMENT MANUAL

36-2 TURNING RADII

Turning radii treatments for intersections are important design elements in that they influence the operation, safety, and construction costs of the intersection. The designer must ensure that the proposed design is compatible with the expected intersection operations.

36-2.01 Design for Right-Turning Vehicles

The following sections present several basic parameters the designer needs to consider in determining the proper pavement edge/curb line for right-turning vehicles.

36-2.01(a) Design Vehicle

Section 36-1.08 discusses the selection of the applicable design vehicle for different intersections. These vehicles are used to determine the pavement edge or curb line. Note that the design vehicle will determine the turning width, vehicular path width or swept-path width. The assumed speed of the vehicle is less than 10 mph (15 km/h).

36-2.01(b) Inside Clearance

Desirably, the selected design vehicle will make the right turn while maintaining approximately a 2 ft (600 mm) clearance from the pavement edge or face of curb.

36-2.01(c) Encroachment

To determine the amount of acceptable encroachment, the designer should evaluate several factors. These would include traffic volumes, one-way or two-way operations, urban/rural location, and the type of traffic control. For turns made onto local facilities, desirably the selected design vehicle will not encroach into the opposing travel lanes. However, this is not always practical nor cost effective in urban areas. The designer must evaluate these encroachment conditions against the construction and right-of-way impacts. If these impacts are significant and if through and/or turning volumes are relatively low, the designer may consider accepting some encroachment of the design vehicle into opposing lanes; see Figure 36-2D.

The encroachment allowed into adjacent lanes of the road or street onto which the turn is made will depend on the following:

 Urban. No encroachment should be allowed into opposing lanes for a right-turning vehicle from a side road or street onto a State route.

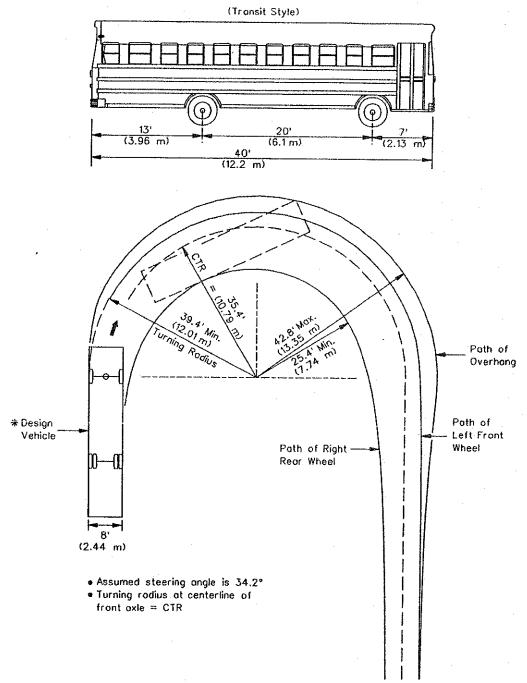
- Rural. For rural intersections, the selected design vehicle should not encroach into the opposing lanes of traffic.
- 3. <u>Multilane Highways</u>. If there are two or more lanes of traffic in the same direction on the road onto which the turn is made, the selected design vehicle can occupy both travel lanes. Desirably, the right-turning vehicle will be able to make the turn while remaining entirely in the right through lane; see Figure 36-2C.

All intersections of two designated State truck routes should be checked to see if the WB-65 (WB-20) design vehicle can physically make the right turn without backing up and without impacting curbs, parked cars, utility poles, mailboxes, traffic control devices, or any other obstructions, regardless of the selected design vehicle or allowable encroachment.

36-2.01(d) Parking Lanes/Shoulders

At many intersections, parking lanes and/or shoulders will be available on one or both approach legs. This additional roadway width may be carried through the intersection. The following will apply:

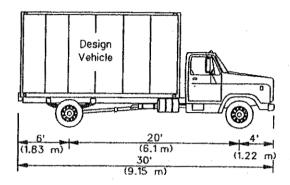
- Parking Lanes. Under restricted conditions, the designer may take advantage of shoulder and/or parking lane to ease the problems of large vehicles turning right at intersections with small radius returns. It will be necessary to restrict the parking a significant distance from the intersection. This area should be delineated with striped pavement markings. Parking should be removed from the intersection according to the ILMUTCD.
- Paved Shoulders. At rural intersections, it may be preferable to continue a paved shoulder throughout the radius return. If a shoulder width transition is required, design it according to Figure 36-2A.
- 3. <u>Curbing</u>. If certain conditions such as drainage requirements, restricted right-of-way, greater delineation, or the desire to minimize off-tracking warrant the use of curbing along the radius return at rural intersections, terminate the curbing at the shoulder edge and transition the curb height as indicated in Figure 36-2A. Where posted speeds are 50 mph or greater, use a mountable type curb.

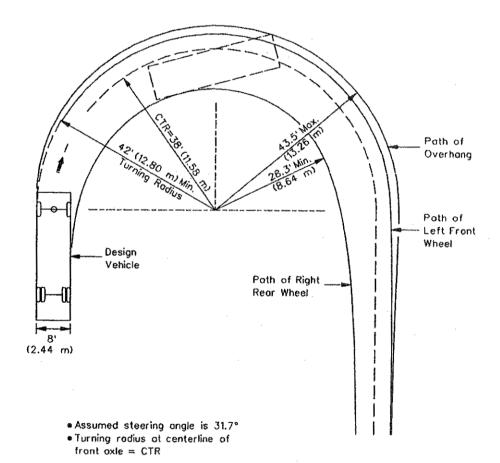


*Note: The 84-passenger school bus is the largest school bus presently manufactured.

MINIMUM TURNING PATH OF 84-PASSENGER SCHOOL BUS (S-BUS)
DESIGN VEHICLE

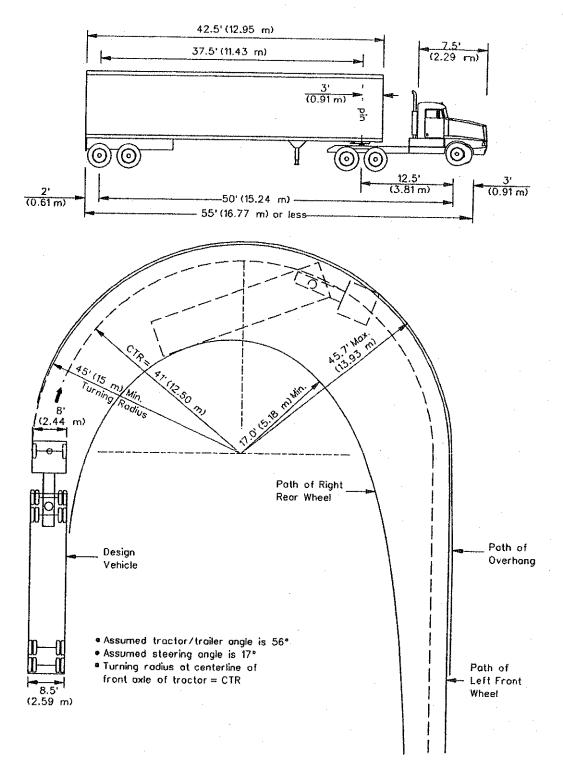
Figure 36-1L





MINIMUM TURNING PATH OF SINGLE UNIT (SU) DESIGN VEHICLE

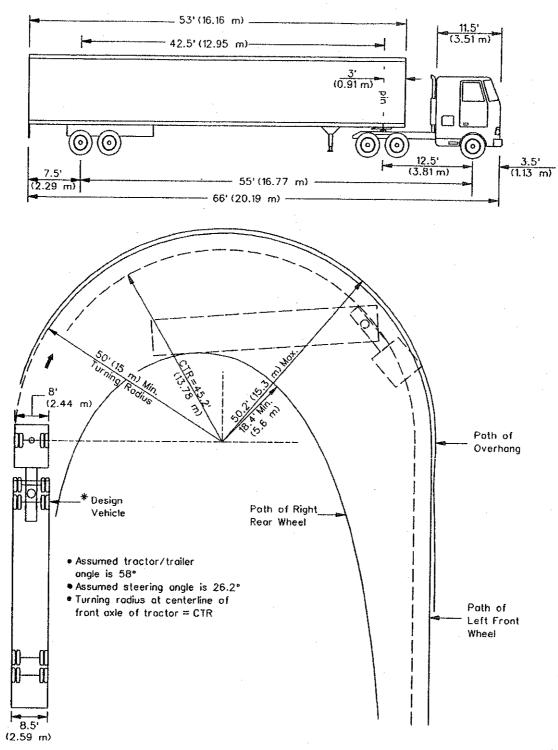
Figure 36-1M



TURNING PATH OF TRACTOR/SEMITRAILER (WB-50 (WB-15))
DESIGN VEHICLE

36-1(26)

Figure 36-1N

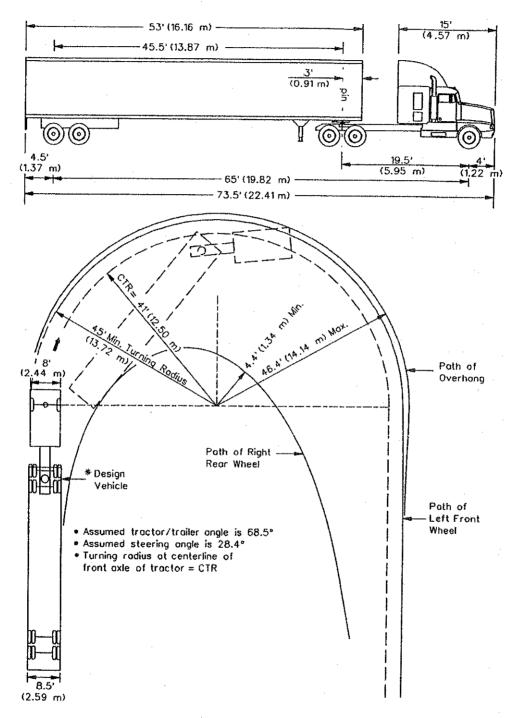


*Note: Presently, trailers are manufactured in lengths of 40 ft (12.19 m), 42.5 ft (12.95 m), 45 ft (13.72 m), 48 ft (14.63 m), and 53 ft (16.16 m).

TURNING PATH OF TRACTOR/SEMITRAILER (WB-55 (WB-17)) DESIGN VEHICLE

36-1(27)

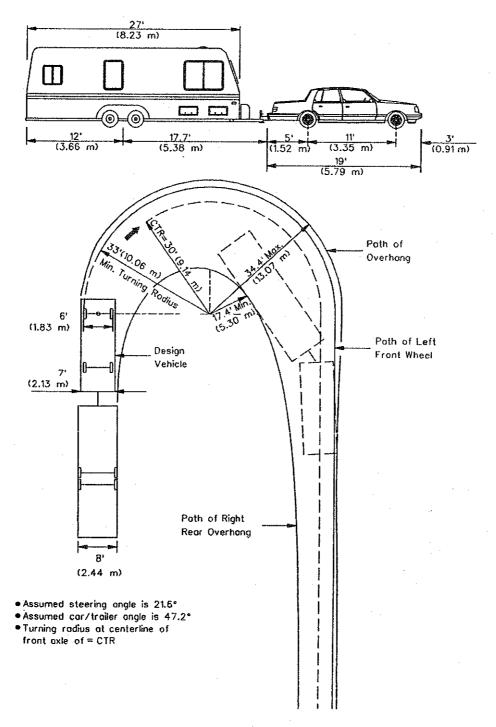
Figure 36-10



*Note: Presently, trailers are manufactured in lengths of 40 ft (12.19 m), 42.5 ft (12.95 m), 45 ft (13.72 m), 48 ft (14.63 m), and 53 ft (16.16 m).

TURNING PATH OF TRACTOR/SEMITRAILER (WB-65 (WB-20)) DESIGN VEHICLE

36-1(28)



MINIMUM TURNING PATH OF PASSENGER CAR AND TRAILER (P/T) DESIGN VEHICLE

Figure 36-1Q

For	Design	
From	Onto	Vehicle (1)(2)(3)
Freeway Ramp	Other Facilities	WB-65 (WB-20)
Other Facilities	Freeway Ramp	WB-65 (WB-20)
	Arterial/SRA	WB-65 (WB-20)
Arterial or SRA ⁽⁴⁾	Collector	WB-55 (WB-17)
	Local	WB-50 (WB-15)
	Local (Residential)	SU*
	Arterial/SRA	WB-55 (WB-17)
Collector	Collector	WB-55 (WB-17)
	Local	WB-50 (WB-15)
	Local (Residential)	SU*
	Arterial/SRA	WB-50 (WB-15)
Local	Collector	WB-50 (WB-15)
1	Local	SU*
	Local (Residential)	SU
Local (Residential)	Arterial/SRA	SU*
	Collector	SU*
	Local	SU
	Local (Residential)	SU

^{*}With encroachment, a WB-50 (WB-15) vehicle should physically be able to make the turn.

Notes:

- 1. Use this figure for new construction and reconstruction projects.
- 2. A smaller design vehicle may be considered as a design exception after an investigation of conditions and with justification.
- 3. For 3R projects, the design vehicle will be site specific with justification
- 4. SRA is a Strategic Regional Arterial route..

SELECTION OF DESIGN VEHICLE AT INTERSECTIONS (Functional Classification)

Figure 36-1R

Type of Truck Route	Design Vehicle	Maximum Length of Trailer Allowed (m)	Maximum Length Kingpin to Center Rear Axle (m)
Class I	WB-65 (WB-20)	53' (16.16 m)	45.5′ (13.87 m)
Class II	WB-65 (WB-20)	53' (16.16 m)	45.5′ (13.87 m)
Class III	WB-55 (WB-17)	53' (16.16 m)	42.5' (12.96 m)
Other State Highway	WB-55 (WB-17)	53′ (16.16 m)	42.5' (12.96 m)
Local Roads and Streets	WB-50 (WB-15)	Not Specified	Not Specified

Illinois Statutes allow additional access off designated truck routes under different conditions. These are defined as follows:

- 1. Any tractor/semitrailer vehicle operating on a Class I truck route shall have access onto any street or highway for a distance of 1 mile (1.61 km) from a Class I highway to load and unload and to allow the driver to obtain food, fuel, rest, or repairs. However, some local highway authorities may post truck restrictions altering this provision. Under this condition, the combination truck units allowed access off the Class I truck route may be up to 8 feet (2.59 m) wide with a 53 foot (16.16 m) long trailer.
- 2. Any tractor/semitrailer vehicle operating on a designated State highway (Class I, II, III, or Other State Highways) shall have access on another designated State highway for a distance of 5 miles (8.05 km) on such streets or highways to load and unload and to allow the driver to obtain food, fuel, rest, or repairs.
- 3. If local authorities designate any street or highway for the same large vehicles and the same uses as stated above, such large vehicles may also use these locally designated highways as truck routes. However, these large vehicles are prohibited from using all other streets and highways under local jurisdiction unless an exception is applicable. An exception would be applicable on a local highway where a combination truck unit is within 5 miles (8.05 km) of a designated truck route and where no restricted weight limit is posted on the local highway. In such cases, the combination truck unit may be up to 8 feet (2.59 m) wide, can have an overall length of 65 feet (19.82 m).

DESIGN VEHICLE SELECTION (Designated State Truck Route System)

Figure 36-1S



SEE FORMAL FILE

LARGE MAPS

UNION PACIFIC RAILROAD COMPANY

ENGINEERING DEPARTMENT COMMUTER OPERATIONS



500 WEST MADISON STREET SUITE 3610 CHICAGO, ILLINOIS 60661. (312) 496-4750

RECEIVED

JAN 20 1999

LAW DEPARTMENT UNION PACIFIC FIR CO.

January 18, 1999

Mr. John Blair Transportation Division Illinois Commerce Commission P. O. Box 19280 527 E. Capitol Avenue Springfield, IL 62794-9280

Dear Mr. Blair:

Reference to the attached Form 1 and previous correspondence concerning the proposed installation of HXP 3's at Algonquin Road, Crossing no. 176958L, in Fox River Grove, IL.

Cost of the material, 2 HXP 3's at \$20,000 each equals \$40,000 that includes all hardware and accessories. The Union Pacific will provide installation at no cost to the Commission.

Sincerely,

G. E. Lienemann

Manager of Field Engineering

GEL:aes

cc: M. H. Shumate, Jr.

DEFENDANT'S EXHIBIT

STATE OF ILLINOIS Illinois Commerce Commission Transportation Division

Form 1

Notice of proposed minor change in crossing protection under 92 Illinois Administrative Code 1535.400(b) and (c).

	Date: 18 JANUARY 1999
To the Illinois Commerce Commission:	
The <u>(NION</u>	(name of railroad company) hereby gives
notice that it proposes to make a change,	designated as a minor change under 92 Illinois Administrative Code
1535.400(b) and (c) in crossing Number	176 958L located near Fox RIVER CORNE
being the crossing of ALGON	(name of street, or highway, if any), with
HARVARD SUB (designation of tracks of	DIV/SIDV. A full statement of the proposed
changes are as follows:	OF HXP-3 (ZEA.)
- INSTALLATION	00- 1/ N 1 S (ZEN.)
	(Railroad Company)
	By Attach additional sheet if necessary)

Completion of this form is necessary to accomplish the statutory purpose as outlined in the Illinois Commercial Transportation Law, Section 18c-7401. This form has been approved by Forms Management Center.



ILLINOIS COMMERCE COMMISSION

November 17, 1998

Mr. G.E. Lienemann Manager Field Engineering Union Pacific Railroad Company 500 West Madison Street Suite 3610 Chicago, IL 60661

Dear Mr. Lienemann:

This will acknowledge receipt of the Union Pacific's Form 1 and Form 2 notices dated September 18, 1998, submitted to the Commission. Below is a list of the Form 1 and Form 2 notices.

DOT 176 957E	Plum Tree Road, Barrington Hills, Illinois
DOT 174 364F	Foxmoor Road, Fox River Grove, Illinois
DOT 176 958L	Algonquin Road, Fox River Grove, Illinois
DOT 176 959T	Lincoln Avenue, Fox River Grove, Illinois

We understand that these filings represent the existing systems and have been submitted to update our records.

Very truly yours,

Daniel S. Drewes

Railroad Safety Program

Daniel S. Drawse

Administrator

\\SPI_03\VOL\RR\Kramer\Form 1 & Form 2\\UP - Fox River Grove.Doc 527 East Capitol Avenue, P.O. Box 19280, Springfield, Illinois 62794-9280

UNION PACIFIC RAILROAD COMPANY

ENGINEERING DEPARTMENT COMMUTER OPERATIONS



500 WEST MADISON STREET SUITE 3610 CHICAGO, ILLINOIS 60661 (312) 496-4750

September 18, 1998

Mr. Daniel Drewes
Railroad Safety Program Administrator
Illinois Commerce Commission
527 East Capitol Ave,
P.O.Box 19280
Springfield, IL 62794-9280

Reference Crossing Numbers DOT # 176 957E Plum Tree Road

176 364F Foxmoor Road 176 958L Algonquin Road 176 959T Lincoln Avenue

176 959T

Dear Mr. Drews:

Enclosed are Form 1's, 2's and front sheets - they do not represent proposed changes, however, they do represent the existing system according to current records. These filings are intended to assure that the records of the Illinois Commerce Commission contain filings for all Union Pacific Railroad Company and predecessor railroad crossings in the state of Illinois. These sheets reference crossings in Fox River Grove, Illinois.

Please acknowledge receipt of this letter by stamping the duplicate copy and returning it in the enclosed self addressed stamped envelope.

Yours truly,

G.E. Lienemann

Manager Field Engineering

cc: M.W. Payette (with enclosures)

M.H. Shumate, Jr. (with enclosures)

C. Shoemaker (with enclosures)

STATE OF ILLINOIS Illinois Commerce Commission Transportation Division

Form I

Notice of proposed minor change in crossing protection under 92 Illinois Administrative Code 1535.400 (b) and (c).

		Date:	-18-1998
the Illinois	Commerce Commission:	•	
The	UNION PACIFIC RAILROAD		hereby give
	(name of r	ilroad company)	
tice that it p	proposes to make a change, designated	as a minor change ur	nder 92 Illinois Administrative Code
535 400 (b) a	nd (c) in crossing Numbe/76 9	58 L located r	near Fox River GRI
JJJ.+00 (0) 4	ind (c) in crossing realmoce		(city or village)
eing the cross	ing of Algon Quin	TOAD	
1,	(name	of street, or highway, i	if any)
HAR	YARD Subdi	Vision	. A full statement of the proposed
	(designation of tracks or lines to be	crossed)	
nanges are as i	follows:		
SEE	ATTACHED	FRON'	t SHEET.
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			IFIC RAILROAD Railroad Company)
		(r	Variorar Company)
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Completion of this form is necessary to accomplish the statutory purpose as outlined in the Illinois Commercial Transportation Law. Section 18c-7401. This form has been approved by Forms Management Center.

🐍 G.E. Lienemann

STATE OF ILLINOIS Illinois Commerce Commission Transportation Division

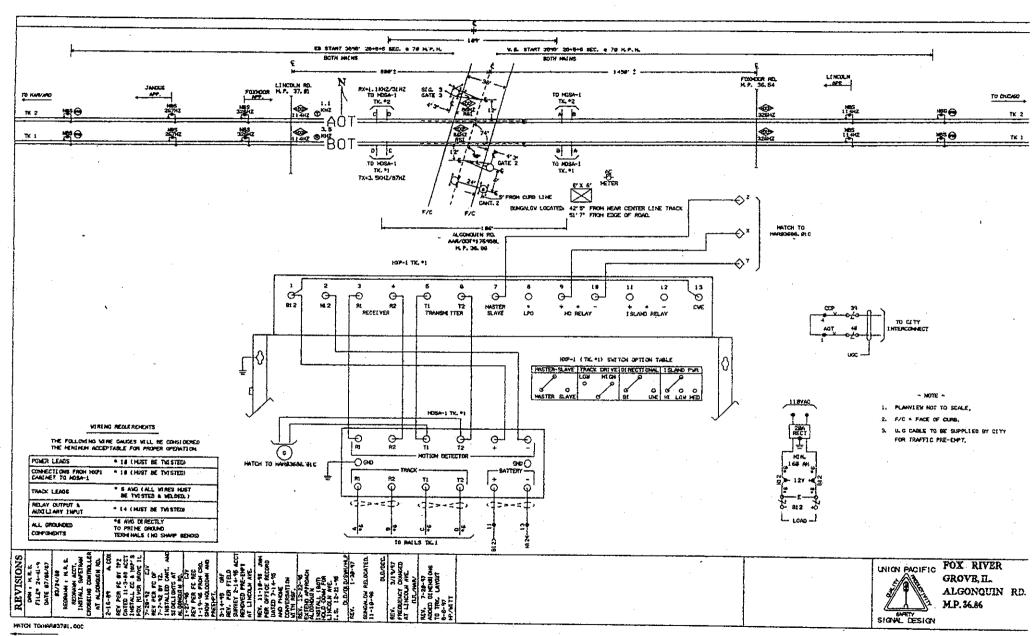
Form 2

Notice of completion of minor change in crossing protection under 92 Illinois Administrative Code 1535.400 (c)

		Date: September 18, 1998
To the Illinois Com	merce Commission:	
The	UNION PACIFIC RAILROA	
	(name of ra	ailroad company)
notice that on	5-6-97	it completed the making of a minor change at
crossing Number _	76 958 L	in accordance with the notice proposing such change given
to this Commission	on <u>4-18-48</u> (date)	<u> </u>
		UNION PACIFIC RAILROAD
		(Railroad Company)
		By Steel Steen amount

Gerry Lienemann

Completion of this form is necessary to accomplish the statutory purpose as outlined in the Illinois Commercial Transportation Law, Section 18c-7401. This form has been approved by Forms Management Center.



SEE FORMAL FILE

LARGE Maps

